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| 10/602,706 | 06/25/2003 | Yasuhiro Yoneda | 239514US90 | 9995 |

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| EXAMINER | |
|---|---|
| DEHGHAN, QUEENIE S | |
| **ART UNIT** | **PAPER NUMBER** |
| 1731 | |

DATE MAILED: 10/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/602,706 | YONEDA ET AL. | |
| | Examiner | Art Unit | |
| | Queenie Dehghan | 1731 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *01 September 2006*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-11,14 and 15* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11,14 and 15* is/are rejected.

7)☒ Claim(s) *6 and 8* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☒ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Specification*

The lengthy specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

1. Claims 6 and 8 are objected to because of the following informalities: claims 6 recites "maximum height", which is inconsistent with the amendment to claim 1. Claim 8 recites "closed space", which is inconsistent with the amendment to claim 2. Appropriate correction is required.

### *Claim Rejections - 35 USC § 103*

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

2. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

3. Claims 1 and 6 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al. (5,817,161) in view of Nomura (5,188,650) and Sato (4,591,373). Regarding claim 1, Takagi et al. disclose a method for manufacturing optical elements comprising: an upper and lower mold (col.2 line 54), where at least one of molds is vertically movable (col. 3 lines 7-8, 13-14) and has a shape such that when the glass material (1) is in contact with the upper and lower mold, a molding surface of one of the molds forms a closed space (3b) with a surface of the glass material (col. 3 lines 34-35 Fig. 1 & 8). Takagi et al. further disclose heating the glass material by thermal conduction by contacting with the upper or lower molds on the side on which the space is formed (col. 3 lines 36-38). Also, Takagi et al. disclose moving the mold the mold for a distance h micrometers after the glass material has come in contact with the upper and lower molds (col. 2 line 66 to col. 3 line 2, col. 5 lines 44-46), when a temperature of the pressing mold is at a temperature in which the glass material exhibits a viscosity of $10^{10.2}$ poises and wherein a maximum height of the space in the direction of the moving of the movable mold is denoted as h micrometers (col. 5 lines 44-49). Takagi et al. also disclose supplying a glass material that has not been preheated, which apparently is at a temperature of less than a temperature at which the glass material exhibits a viscosity of $10^{11}$ poises, between the upper and lower mold (col. 5 lines 22-39). Furthermore, Nomura teach of a vertically slidable mold used for pressing optical elements (col. 2 lines 48-52), where glass material is supplied at a temperature less than a temperature

at which the glass material exhibits a viscosity of $10^{11}$ poises (col. 4 lines 31-36). However, Takagi et al. fail to teach of a moving rate of the mold while pressing. Sato teaches several variables to consider while pressing optical elements with the desired surface accuracy, including the moving speed of the mold of 0.5-2μm/sec (0.12mm/min) (col. 1 lines 33-63). It would have been obvious to one of ordinary skill in the art at the time the invention was made to the press molding speed of Sato in the process of Takagi et al. in order to better control the accuracy of the optical element when molding, as taught by Sato.

4. Regarding claim 6, in addition to the elements covered in claim 1, Takagi et al. disclose a glass material that is essentially not in a softened state and pressing the glass material when it has reached a temperature such that the viscosity of the glass material is within the range of $10^{7.4}$ to $10^{10.5}$ poise, but fail to teach a temperature difference between the outer surface of the glass and the interior of the glass. However, since Takagi et al. disclose the necessary step of heating up the glass material through contact with the molds, one of ordinary skill in the art would expect the outer surface of the glass material to be higher than the interior of the glass material when at a temperature in which the glass material exhibits a viscosity of $10^{10.2}$poise since it is the outer surface that is in contact with the heat source. Furthermore, Nomura teaches the expected temperature difference between the outer surface and interior of a glass material when placed into a mold for pressing (col. 2 line 67 to col. 3 line 3). It would have been obvious to one of ordinary skill in the art at the time the invention was made to expect a higher outer surface temperature than the interior of the

glass material at the beginning of the pressing step of Takagi et al., as suggested by Nomura, because a cooler glass material being heated from thermal conduction would naturally heat up from the outer surface and work towards the central portion of the glass.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al. (5,817,161) in view of Nomura (5,188,650) and Sato (4,591,373), as applied to claim 6 above, and in further view of Marechal et al. or Hirota et al. (6,918,267). Nomura teaches preheating the glass material prior to supplying it to the mold (col. 4 lines 32-36). However, both Nomura and Takagi et al. fail to teach supplying glass at a temperature with a corresponding viscosity in the range of $10^{7.4}$ to $10^{10.5}$ poises. Marechal et al. teach supplying glass material that has been heated to a temperature such that it exhibits a viscosity about $10^{8}$ to $10^{10}$ poises (col. 3 lines 57-60, 63-64, col. 4 lines 54-56). Hirota et al. disclose the preheating of glass material to a temperature in which the glass material exhibits a viscosity of $10^{8}$ poise (col. 10 lines 50-66). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the preheating step of Marechal et al. or Hirota et al. in the processes of Takagi et al., Nomura, and Sato in order to promote surface accuracy, as taught by Hirota et al.

6. Claims 2 and 8 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al. (5,817,161) in view of Nomura (5,188,650), Sato (4,591,373), and Marechal et al. (4,481,023) or Hirota et al. (6,918,267), as applied to claims 1 and 7 above, and in further view of Kataoka et al. (5,904,747). Takagi et al. teach a mold with a concave surface that forms the closed space in Fig. 1 and 8, but do not mention the

radius of curvature. Takagi et al. also teach a press molding process comprising of several pressing stages in order to prevent surface deformations on the optical element due to the buildup pressure in the closed spaces. Kataoka et al. present a solution to preventing the surface deformation on the optically functional area of the optical element but using a glass material with a radius of curvature larger than the radius of curvature of the molding surfaces. Hence, Kataoka et al. teach of a mold with concave surface with a radius of curvature r1 that is smaller than the radius of curvature of the glass material, which has a convex surface, which forms the closed space with the mold in figure 7. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the radius of curvature of Kataoka et al. in the process of Takagi et al., Nomura, Sato, Marechal et al., and Hirota et al., in order to limit flaws in the optical element to a perimeter outside of the non-functional optical area, as taught by Kataoka et al.

7. Claims 3, 4, 9 and 10 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al. (5,817,161) in view of Nomura (5,188,650), Sato (4,591,373), Marechal et al. (4,481,023), and Hirota et al. (6,918,267), as applied to claims 2 and 8 above. Takagi et al. disclose applying a pressure on the mold to press the glass after being in contact with the upper and lower molds and traveling a distance of h micrometers (col. 5 lines 42-49). Takagi et al. further apply a second pressure to the glass, but the pressure is not of increasing value (col. 6lines 15-16). Nomura teach increasing the pressure applied to a glass material while in the molding process, wherein a first pressure of 50kgf/cm$^2$ was increased to 120kgf/cm$^2$ after 30 seconds

(and after traveling a certain distance) and further increased to 200kgf/cm$^2$ after another 60 seconds (Figure 4 and col. 5 lines 3-8, 41-4, 57-59). The increasing pressure rate from 50kgf/cm$^2$ to 120kgf/cm$^2$ after 30 seconds and to 200kgf/cm$^2$ after 60 seconds can be calculated as follows:

(120kgf/cm$^2$ - 50kgf/cm$^2$ )/30 seconds = 2.3 kgf/cm$^2$ per second

or 0.023 kgf/mm$^2$ per second

(200kgf/cm$^2$ - 120kgf/cm$^2$ )/60 seconds = 1.3 kgf/cm$^2$ per second

or 0.013 kgf/mm$^2$ per second

It can be seen that the increasing pressure rate is less than 0.5 kg/mm$^2$ per second. It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the increasing pressure rate of Nomura in the process of Takagi et al., Sato, Marechal et al., and Hirota et al. in order to accommodate for the increasing temperature of the interior of the glass material while heating on the mold, as taught by Nomura.

8. Claims 5 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al. (5,817,161) in view of Nomura (5,188,650), Sato (4,591,373), Marechal et al. (4,481,023), and Hirota et al. (6,918,267), as applied to claims 4 and 10 above. Takagi et al. disclose a two step pressing method where the glass has been pressed while the mold has move a distance h (col. 5 lines 44-49) followed by a pause in pressure (col. 5 lines 56-57), indicating a moving rate of the mold to be zero and then resume moving the mold again to continue pressing the glass material (col. 6 lines 15-

20) indicating an increase in the moving rate of the mold (from zero to moving) after the mold has moved a distance h.

9. Claims 14 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Takagi et al. (5,817,161) in view of Nomura (5,188,650) and Sato (4,591,373), as applied to claims 1 and 6 above, in further view of Kataoka et al. (5,904,747). Takagi et al. disclose a press molding process comprising of several pressing stages in order to prevent surface deformations on the optical element due to the buildup pressure in the closed spaces, but fail to disclose a single pressing of the glass material. Kataoka et al. present a solution to preventing the surface deformation on the optically functional area of the optical element but using a glass material with a radius of curvature larger than the radius of curvature of the molding surfaces (similarly to the recited element of claim 8 of the applicant's invention), thus eliminating multiple pressing stages. Hence, Kataoka et al. teach a press molding process wherein the glass material forms closed spaces with the upper and lower molds and is pressed in a single press (figure 3, col. 4 lines 19-21). It would have been obvious to one of ordinary skill in the art at the time the invention was made to utilize the single pressing Kataoka et al. in order to have a more efficient press molding process.

***Response to Arguments***

10. Applicant's arguments filed September 1, 2006 have been fully considered but they are not persuasive.

11. In response to applicant's argument that the references of Takagi et al. and Nomura fail to show certain features of applicant's invention, it is noted that the features upon which applicant relies (i.e., pressing in a single step) are not recited in the rejected claim(s). Although the claims are interpreted in light of the specification, limitations from the specification are not read into the claims. See *In re Van Geuns*, 988 F.2d 1181, 26 USPQ2d 1057 (Fed. Cir. 1993). Furthermore, Nomura recites pressing in a continuous manner, indicating a single pressing.

12. In response to the applicant's argument regarding the prior art of Marechal et al., it would have been obvious to one of ordinary skill to want to reduce processing time. Takagi discloses a multiple pressing process that is necessary for eliminating surface defects. This is no indication that one would not be concern with reducing processing time in other processing steps. Furthermore, one of ordinary skill in the art would expect the heating of the outer surface of a glass material to involve the overall heating the glass. Therefore, the overall heating of the glass material of Marechal et al. would result in an outer surface with the recited viscosity.

13. In response to the applicant's argument regarding claims 2 and 8, the applicant believes the reference fails to suggest the combination. As mentioned above, Kataoka et al. presents an alternative and more efficient solution to removing surface deformations on the optical element.

14. In response to the applicant's argument regarding claims 3,4,9,and 10, Takagi et al. press molding process uses a constant pressure during the pressing stages and Nomura et al. do disclose a single continuous pressing step.

15. In response to the applicant's argument regarding claims 5 and 11, the applicant's arguments fail to comply with 37 CFR 1.111(b) because they amount to a general allegation that the claims define a patentable invention without specifically pointing out how the language of the claims patentably distinguishes them from the references.

16. Applicant's arguments with respect to claim 1 and the prior art of Ikeda have been considered but are moot in view of the new ground(s) of rejection.

***Conclusion***

17. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. It is further noted that similar to Takagi et al., Hirota et al. (4,915,720) also teach molding glass articles with a mold temperature, such that the glass has a viscosity in a range of $10^8$ to $10^{9.5}$ poises and that glass with a viscosity of $10^{10.5}$ to $10^{12}$ poises can only be pressed a few micrometers (col. 2 lines 47-49, 63-64). Also, both Shigyo et al. (5,173,100) and Izumitani et al. (4,738,703) teach of a distance that the mold is moved while pressing glass is in the order of microns (col. 2 lines 41-42, col. 3 lines 30-32, respectively) and that it can be controlled by a flange meeting the mold (Shigyo et al. col. 5 lines 25-27).

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Queenie Dehghan whose telephone number is (571)272-8209. The examiner can normally be reached on Monday through Friday 8:30am - 5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Steven Griffin can be reached on 571-272-1189. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Q Dehghan

ERIC HUG
PRIMARY EXAMINER